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Lee T. Railsback

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Lee T. Railsback, D.V.M.

SWINE ERYSIPELAS is a controversial subject and some may disagree with almost any statement made concerning it. The disease is too vast in scope for any one branch of the profession to observe in all its variations. Practitioners must necessarily take as facts some of the things investigators have found in the laboratory. The laboratory men, in turn, do not have the opportunity to see all the variations of the diseases that we see in the field. Therefore, we must approach erysipelas as a team.

Some of the basic things in understanding the disease which are accepted by a large percentage of our profession are: 1) Swine erysipelas is infectious, but not highly contagious; 2) although the erysipelas bacillus is not a spore-former, it is quite resistant to adverse conditions such as drying and putrifactive changes; 3) the bacterium will live in the soil a considerable time without swine being present and, under favorable conditions, may even multiply; 4) The organism grows more favorably in some soils than others and displays a capacity to change suddenly from a relatively harmless saprophyte to a decidedly pathogenic parasite.

Explain these facts to your clients. It helps them to better understand some of the peculiar twists the disease may take on their farms. Also impress your clients with the fact that the diagnosis of swine erysipelas is not always easy; that all stiff pigs do not have erysipelas; that swine erysipelas is not the only cause of enlarged joints and arthritis; and that the symptoms of the disease are many and varied, depending upon the type and stage of the disease.

Dr. Railsback is a general practitioner at Ellsworth, Minn. He received his D.V.M. from Kansas State College in 1937. This paper was given at a swine disease short course in Wis.

FARM HISTORY

The erysipelas bacillus will live and even multiply in the soil, even though swine are not present. When observing sick hogs on a farm where erysipelas has been previously diagnosed, keep that fact in mind. If diagnosed again, there is not much reason for the client to wonder where the infection came from, he has had it with him all the time. Make this fact clear the first time the disease is diagnosed on a farm.

DIAGNOSIS

To me, herd history, observation, and examination, along with farm history, are the most revealing of all phases of diagnosis. Yet, postmortem examination and laboratory confirmation must not be overlooked. Also, there is no substitute for being able to observe the pigs in their normal surroundings.

For diagnostic purposes, erysipelas should be divided into the acute septicemic form and the chronic form. However, all chronic erysipelas may have been acute sometime; starting out as a mild septicemia and carrying a temperature for a few hours or days, then gradually developing into the chronic form. This phase causes far more economic loss, and I believe there is a lot of it that is never diagnosed, since it is the acute type that is most apt to excite the client.

SYMPTOMS

The symptoms of **acute erysipelas** are varied and difficult to describe. Perhaps those most frequently seen may be de-

scribed as follows: A pig has a history of not coming out for his morning feed. As the pig is observed from a distance, it just lies watching every movement with a clear, alert eye. If approached, the pig may jump and run, usually with an arched back and stiffened gait. Further observation shows that he may drink and take a few bites of feed, and may even "warm out" of his lameness somewhat. But, he will soon lie down again. He may fight like a healthy pig when his temperature is taken (temperature may range from 105 to 109°F.) Such pigs apparently dislike to move because it is painful. When these symptoms appear in one or several pigs along with a history of a sudden death, especially on a farm where the disease has occurred before, erysipelas can be diagnosed with confidence.

On some occasions, a different set of symptoms may lead to a diagnosis of erysipelas. The pig may have the following history and symptoms: It may be eating at noon and lying prostrate in the evening; it will not need to be held when the temperature is taken; the temperature will vary from 105 to 109°F; the bright look is gone from the eyes, which are probably closed; you can shake the pig and it may get on its feet; the gait is not stiff, but limber; there is extreme muscular weakness. In contrast to the first pig described, these pigs are not mentally alert—they are downright sick.

Between these two extremes, there are many degrees of symptoms, and no single one is pathognomonic. It takes a combination to make the picture, but of all the classical symptoms, I find the temperature is the most significant. Some pigs may run a temperature of 105 to 109°F. and still appear normal. I believe all cases show elevated temperatures at the onset of the disease. The temperature of the pig is also valuable in determining what response you may expect from treatment.

After a pig has been sick a couple of days, quite often there is respiratory distress as evidenced by shallow breathing. Frequently red patches will develop in the skin. These patches may be observed on the ears, snout, lower surfaces of the body, and along the back. They usually turn dark purple and do not blanch on pressure. If the individual lives, these areas may peel in large patches. If too large an area peels, such as the entire back, the hog may have to be destroyed.

Another form of acute erysipelas is the skin type, formerly known as "diamond skin disease" due to the characteristic shape of skin lesions. On large hogs, the patches are often detected when the temperature is taken. They have been aptly described as feeling like a bunch of bumble bee stings. This type of erysipelas does not attack an entire herd, but may be observed in a small percentage of these pigs that sicken in any given outbreak, and in many outbreaks is not observed at all.

Postmortem examinations. Postmortem examinations should be performed if dead animals are available, and continued until a positive diagnosis is made. Most opportunities for necropsies will be in acute outbreaks. In outbreaks where no hogs are dead, slaughtering a sick animal may not be justified since a large percentage of seriously affected pigs will make recoveries after treatment.

LESIONS

As I am an ordinary pathologist, the lesions I see on postmortem examinations are necessarily very pronounced. Those most commonly observed as: 1) swollen, juicy lymph nodes with or without hemorrhage; 2) mild gastritis; 3) enteritis of small intestines in some instances; 4) slightly enlarged spleens; 5) paint-brush hemorrhages on the greater curvature of the stomach; 6) even though the literature tells us that inflammatory lesions of the lungs are rare in acute erysipelas, hemorrhage in the lungs; 7) vegetative growths on the heart valves, commonly known as "cauliflower growths" because of their characteristic appearance. This condition is usually observed in individuals that have made apparent recoveries from acute erysipelas; 8) joint fluids may have taken on a flaky appearance. The soft tissues of the joint

may be enlarged at first, later changing to a periostitis as the disease becomes chronic.

As pointed out before acute erysipelas is a septicemia; and as an acute septicemia, it may display all the postmortem lesions of any of the septicemias, including hog cholera. For this reason, herd observation, farm history and laboratory confirmation are more important than the post mortem picture in diagnosing the disease.

Laboratory examination. I routinely submit specimens to the laboratory from all necropsies when erysipelas is suspected. The organs submitted from the acute form are the tied-off heart, spleen, kidney, part of the lungs, and some lymph nodes along with joints and other affected tissues from the chronic type. These tissues are sent even though treatment begins immediately. When the disease is acute, the organism is apparently easily grown in the laboratory in most instances and you can usually get a report, if positive, within 24 to 48 hours. Even though by the time the report is rendered, the sick animals' response to treatment may be confirming your diagnosis, a laboratory confirmation of the diagnosis helps build confidence of the diagnostician and will increase his client's confidence in him.

TREATMENT

In treating acute erysipelas I use procaine penicillin in oil in conjunction with erysipelas serum, and I have had much better results than from serum alone. Procaine penicillin in oil is the product of choice because of its longer periods of therapeutic action. It is administered in doses of not less than 3,000 units per pound of body weight, and is injected in the ham. I graduate serum dosages from 10 cc. in baby pigs up to 40 cc. in sows.

I have not kept any record of my results except for ear markings of the pigs treated, but later observation of herds and conversation with owners have shown gratifying results. Some of the weak, helpless pigs are up fighting for a place at the trough within 24 hours. I believe that 85 to 90 per cent of the pigs treated while temperatures are at or near the peak make an apparently complete recovery and go to market at the same time as the remainder of the herd. The other 10 to 15 per cent show symptoms of chronic erysipelas or die.

Animals that survive 4 or 5 days, even though not treated, have a good chance of living. I am not convinced that visibly sick animals completely recover unless treated, and perhaps not then. Many so-called recoveries later manifest symptoms of chronic erysipelas such as stiffness, enlarged joints, and valvular endocarditis. It is sometimes difficult to convince a purebred breeder selling breeding stock that the pig treated for acute erysipelas, and which has grown as fast as any others in the herd, might possibly have chronic erysipelas and not be a good risk for one of his clients.

Hog Cholera Serum. It is well to remember that hog cholera or any other disease may occur with swine erysipelas. Since erysipelas often exists in the chronic form and may revert to an acute condition, it is often seen with other diseases. Prior to 1931, many outbreaks of erysipelas are thought to have been misdiagnosed as hog cholera. No doubt the same situation still exists. Such a misdiagnosis is usually not too embarrassing, but I think of no greater mistake a practitioner can make than to diagnose hog cholera as erysipelas. Hog cholera is about the only disease that might "wipe the client out" of the hog business. Some of the symptoms and lesions are so similar that the two diseases may be easily confused.

Hog cholera serum may be beneficial when given in almost any disease, as well as for hog cholera. I recommend cholera vaccination in conjunction with erysipelas treatment of pigs not cholera-immune. Double treating for cholera and erysipelas may be done at the same time if desired. It has been observed for years that some hog cholera serum has a therapeutic action when given to an erysipelas-infected pig, but even though this is the case, it is not a dependable treatment. When I kow acute erysipelas is present, even though I am double treating, I give erysipelas serum along with hog cholera

serum. I have seen an outbreak of acute erysipelas in a herd 10 days following double treatment for hog cholera. Such a diagnosis should not be made unless confirmed by the laboratory. We should not try to cover up post-vaccination troubles with a phoney diagnosis of erysipelas.

PROPHYLAXIS

Serum and Culture. Since I reside only one mile from the Minnesota-Iowa line, my practice is in both states. Until the fall of 1949, we were not permitted to use erysipelas culture in Minnesota, consequently, we had an opportunity to observe erysipelas where two types of immunization were used in the same practice. Erysipelas herds are much easier to handle in my practice when I can use culture. I like the longer immunity obtained from such treatment in preference to treating with serum alone. Serum and culture does not give 100 per cent protection and we do not know how long such protection lasts, but those that have had a lot of trouble with erysipelas will be well satisfied with the immunity it does give in most instances. It will prevent hard feelings later if we make it a practice to explain to our clients that we do not know the duration of the immunity.

I believe that the older the pigs are before they are vaccinated, the longer the duration of immunity; but for best results, the pigs should be inoculated before they become infected.

Our ideas on the dosage of serum and culture have gradually changed. My dosage has been as follows:

1 week to 75 lbs.—3 to 5 cc. serum and ½ cc. culture.

75 to 100 lbs.—5 to 7 cc. serum and ¾ cc. culture.

100 to 200 lbs.—10 to 15 cc. serum and 1 cc. culture.

Sows and gilts—20 cc. serum and 1 cc. culture.

Investigators have found that some culture has not been very stable in the past. Whether it is at the present, I don't know. The short dating on liquid erysipelas culture obviously points to the fact that it is an unstable product, so for this reason, I prefer to use desiccated culture.

Erysipelas Bacterin. Since I've had very satisfactory success following the use of serum and culture, I've used only a limited amount of erysipelas bacterin. I know a lot of it is being used in the field. If it proves to give a satisfactory immunity, it offers a definite advantage, price wise, over serum and culture in pigs from 75 lbs. up.

ERYSIPELAS IN MAN

Erysipelas is infectious to man, and we should constantly keep this fact in mind for both our own and our clients' welfare. In man, the infection usually takes place through a wound. Such an infection may be the result of an accident with a culture needle. If such an accident does occur, we should see our physician immediately. If it happens to a client, recommend that he see his physician and try to make sure he gets there. In addition to this, I call his physician to make sure he gets the correct history. Also, gloves should be worn during postmortem examinations and while handling culture.

CONCLUSIONS

If swine erysipelas has followed any definite pattern or cycle in my practice, I have not recognized it.

Since erysipelas presents itself in so many different ways and at unpredictable times, I stress the following points constantly to my clients:

1. Diagnosis of erysipelas is not always easy. The symptoms vary and it can be confused with other diseases. If practical, the diagnosis should be confirmed at the laboratory.

2. Once a farm is infected, it may remain so indefinitely, even though the disease does not present itself for a number of years.

3. Even though I recommend protecting pigs on infected farms by vaccinating them with serum and sulture, we don't know definitely how long such an immunity will last. —*End*